Saskatchewan
Labour
Occupational Health
and Safety

Transferring and Transporting

Liquid Manure

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Please note

Remember that this publication doesn't replace the Act and regulations. You still need to refer to the legislation to find out exactly what requirements apply to your organization. To order a copy of the legislation, contact the Queen's Printer at:

> 1st Floor, 1871 Smith Street, Regina SK S4P 3V7. Phone: (306) 787-6894, or toll free in Saskatchewan 1-800-226-7302; Fax: (306) 787-9779, (or see the website at: www.qp.gov.sk.ca).

Workplaces with 10 or more workers listed in Table 7 of the Appendix to *The Occupational Health and Safety Regulations* must have an occupational health and safety program. If you must implement a program, read *Elements of an Occupational Health and Safety Program,* and *Setting Up An Occupational Health and Safety Program: A Guide*. The Occupational Health and Safety Division provides both publications or visit our website at: www.labour.gov.sk.ca. For related regulatory information, read *The Occupational Health and Safety Act*, Part III; and *The Occupational Health and Safety Regulations*, Part IV, and section 22.

Industries under federal jurisdiction, such as transportation, broadcasting, and telecommunications, are governed by *The Canada Labour Code.* If you work in a federally regulated industry, please contact the appropriate agency for information, or visit the Human Resources Development Canada website at: www.hrdc-drhc.gc.ca.

Introduction

Intensive livestock operations (mostly hogs and cattle) store liquid manure in lagoons or tanks. Most operators empty their storage facilities once or twice a year. Emptying begins by agitating the manure to create a slurry. The slurry is pumped into tanker trucks for direct field application, or through a drag hose system to tractors in the fields. Unless handled properly, these operations can be very dangerous.

Saskatchewan workers have been killed or seriously hurt while storing, agitating, or transferring effluent. For example, in September 1998, three workers died after being overcome by manure gas in a truck holding tank. A fourth worker tried to rescue them. He survived, but had to be hospitalized.

Workers in other provinces have also been killed while handling or transporting liquid manure.

How this publication can help you

This publication deals with how to transfer and transport liquid manure safely. It summarizes the main hazards and regulatory requirements, and discusses how employers can protect their workers. It does not deal with collection processes or storage facilities.

After reading this booklet, employers will still need to examine their operations and review the legislation to determine what additional precautions should be taken.

Notes

Identify the hazards

- Manure gases
- Biohazards
- Slips, trips, and falls

Introduction

Workers may be hurt by the gases and biohazards in liquid manure. Common causes of injuries and illnesses include:

- being overcome by manure gases, mostly hydrogen sulphide (H_2S)
- being harmed by biohazards
- slipping, tripping, and falling

Manure gases usually pose the greatest risk.

Manure gases

The four main gases produced from rotting manure are:

- hydrogen sulphide
- methane
- ammonia
- carbon dioxide

Hydrogen sulphide causes the most problems. Manure gives off large quantities of it during agitation. One or two breaths of air contaminated with 600 parts per million (ppm) of hydrogen sulphide can cause immediate loss of consciousness! Continued exposure can kill.

Hydrogen Sulphide Exposure Levels and Health Effects	
Exposure Level	**Expected Health Effect or Symptom**
10 ppm (This is the workplace 8 hour contamination limit prescribed in *The Occupational Health and Safety Regulations*)	Eye irritation
20 ppm for more than 20 minutes	Eye, nose, and throat irritation
50 to 100 ppm[1]	Vomiting, nausea, and diarrhea. Loss of smell at 100 ppm
200 ppm	Dizziness, nervous system depression, increased susceptibility to pneumonia. Fluid may accumulate in the lungs with prolonged exposure.
500 ppm for 30 minutes	Nausea, excitement, unconsciousness
600 ppm and above	Paralysis of the respiratory system and rapid death
Note: 1 part per million (ppm) of hydrogen sulphide is the same as 1.42 milligrams of hydrogen sulphide per cubic metre of air (mg/m³).	

Hazardous situations arise whenever manure gases are concentrated in a confined space or suddenly released into a work environment. Agitation increases the rate of release.

Unusual circumstances may increase the risk. For example, hot weather can increase the rate of manure decomposition and thus the amount of hydrogen sulphide in the mix. Windless days can increase the chance that localized pockets of hydrogen sulphide will form in the work environment during agitation.

[1] The *Immediately Dangerous to Life or Health* (IDLH) concentration for hydrogen sulphide is **100 ppm**. At this level the atmosphere is so dangerous that anyone not using an approved respirator will not be able to escape, or will suffer irreversible health effects, if he or she does not **leave the dangerous atmosphere within 30 minutes**.

Biohazards

Manure usually contains viruses, bacteria, fungi and their spores, etc. (biohazards). Workers can be exposed by:

- inhaling contaminated manure particles
- having skin or wounds come into contact with biological substances or contaminated tools, equipment, facilities, machinery, clothing, and so forth
- ingesting organisms transferred to the mouth when eating, drinking, smoking, or using the washroom

Harmful health effects

Problems can include:

- eye, skin, nose, and respiratory tract irritation and infection
- asthma and other respiratory sensitivities and conditions
- infections

Infections

There are no published statistics describing how often or how many workers who handle liquid manure become infected. However, there are published reports of cases of diseases associated with exposure to manure, sewage, and animals. Unfortunately, the extent and nature of exposure in these cases are not described very well.

The risk of contracting serious diseases from liquid manure appears to be low. The risk of contracting a specific disease is smaller where the source (animal or human) has been immunized against that disease. For example, animals that have been immunized against Leptospirosis are not likely to shed large numbers of Leptospira organisms in their urine.

Given the success of the polio vaccine, it is highly unlikely that liquid human manure would include polio virus.

Some infections associated with handling liquid manure

People with impaired immune systems (such as those infected with other diseases or taking medications affecting the immune system) have a greater risk of contracting the following infections:

- skin infections from bacterial species such as *Erysipelothrix rhusiopathiae* (Erysipeloid), *Streptococci spp*
- respiratory infections from species such as *Listeria monocytogenes* and certain species of *Aspergillus* and other fungi (in persons with compromised immune function)
- diarrhea and other gastrointestinal problems, when transferred to the mouth and swallowed. Some species of *Salmonella* and strains of *E. coli* (including the enterohaemorrhagic *E coli* 0157:H7) and other fecal microorganisms can survive in liquid manure and remain infectious for extended periods of time.
- infections of the eye and other tissues from *Leptospira interrogans*
- liver disease from the *Hepatitis A* virus, if the manure contains human feces
- tetanus from *Clostridia tetani* bacteria that can be present in liquid manure
- other types of organ diseases from species such as some *Salmonella spp*, some species of *E. coli* and, *Listeria monocytogenes*

Slips, trips, and falls

Workers are often injured in this way when working on or using wet, muddy, or contaminated ladders, footrests, steps, platforms, or truck tank tops. Workers also fall into lagoons, pits, and tanks.

Assess the risks

- Potentially hazardous areas
- Potentially hazardous activities

Introduction

The employer has a responsibility to identify, assess, and control workplace hazards. Start by examining the hazards of these work areas and activities.

Potentially hazardous areas

These include:

- lagoons, storage tanks, and pits
- holding truck tanks
- shacks over central collection pits

Potentially hazardous activities

Examples include:

- working near lagoons, tanks, or pits that don't have fall protection
- agitating and transferring liquid manure
- working on top of holding truck tanks
- entering truck tanks, storage facilities, and pits

Notes

Control the risks

- Make truck tanks and storage facilities safe
- Develop safe work procedures
- Provide personal protective equipment and washing facilities
- Train workers
- Provide competent supervision
- Prepare for emergencies

Introduction

Many hydrogen sulphide fatalities involve confined spaces of various kinds. This chapter will help you, the employer, deal with the hazards of confined spaces by taking these steps.[1]

1. Begin by using engineering controls to make all confined spaces as safe as you can.
2. Then, develop safe work procedures to control the risks during hazardous jobs and tasks.
3. Provide appropriate personal protective equipment and washing facilities to reduce the risk of harm from physical and biological hazards.
4. Train workers and supervisors to carry out their responsibilities properly.
5. Finally, develop an emergency response plan.

[1] These steps aren't necessarily carried out in this order. Often you will go back and forth between steps or carry out several things at once.

Make truck tanks and storage facilities safe

Whenever possible, use engineering controls to clean truck and other manure storage tanks from the outside (see regulation 267 [c]). For example, equip each tank with cleanout wands or nozzles so that the interior can be flushed with water without requiring workers to enter.

The insides of truck tanks may have to be modified to make them safer. For instance, baffles inside a tank may make it difficult to rescue an injured worker. Therefore, the employer must modify the tank so that it is possible to get an injured worker out without sending anyone else into the tank.

Secure confined spaces

The employer can only allow workers **who are fully trained in confined space entry** to enter any confined space. Keep everyone else out. Common methods of securing a confined space include:

- erecting guard rails or other barriers (include toe boards to keep people from sliding underneath the guard rails or barriers)
- putting up fences or screens, or barring openings and locking hatches

Post warning signs at confined space entry points

Post warning signs, such as:

- *Danger: hydrogen sulphide and methane hazards in tank. Gases can cause loss of consciousness and death.*
- *Do not come close to the open hatch unless you are using a lifeline, a harness, and a supplied air respirator.*

Develop safe work procedures

Review each dangerous job and develop safe work procedures. Use these procedures to train workers. Here are a few examples of where work procedures should be used.

Prevent accidents when workers enter tanks

The insides of truck mounted holding tanks usually have the highest concentrations of hydrogen sulphide. To protect workers, the employer should forbid anyone other than authorized, trained personnel from entering these tanks. The employer must make sure that supervisors and workers strictly follow written procedures whenever they enter this type of hazardous confined space.

Develop procedures for work near lagoons and tanks

Work procedures must deal with potentially hazardous work areas and activities.

When working near lagoons or above ground storage tanks, the wind will normally prevent airborne hydrogen sulphide levels from rising above 10 ppm. If levels rise above 10 ppm, work should stop. If levels remain above 10 ppm, exposed workers must wear approved air supplied respirators.

Determine the cause of the elevated hydrogen sulphide levels and reduce them. One option is to move the work to a location where the hydrogen sulphide level is below 10 ppm (for example, upwind).

Provide personal protective equipment and washing facilities

The employer can protect workers at risk by:

- providing full faceshields, rubber boots, gloves, and disposable Tyvek-type coveralls or rubber aprons
- ensuring that washing facilities, soap, and clean, fresh, towels are readily available
- purchasing or modifying equipment and machinery to minimize worker contact with effluent, as well as to minimize the formation of dust, droplets, and mists

- equipping each worker entering a tank with a full body harness and lifeline. Provide the harness, lifeline, and a mechanical lifting device to allow helpers to perform a rescue without having to enter the tank.

Train workers

Workers must be trained about:

- the responsibilities of the employer and supervisor
- the hazards present at the place of employment and the possible risks
- their rights (to know, participate, and refuse work believed to be unusually dangerous) and responsibilities
- hazard controls, safe work procedures, and personal protective equipment that must be used
- procedures for handling health and safety concerns
- first aid and emergency procedures

The employer must make sure that workers are trained to respect hydrogen sulphide and understand how quickly it can kill. Workers should understand the significance of being exposed to hydrogen sulphide at various levels and what actions must be taken. For example, workers must understand that hydrogen sulphide causes loss of smell at levels as low as 100 ppm. This means that workers should be warned never to use their noses to tell them how much hydrogen sulphide is in a confined space!

Train workers who will use respirators

The employer must make sure workers who will use respirators:

- are trained by a competent instructor
- know the limitations of their respirators
- know how to inspect, test, use, maintain, and store their respirators properly
- demonstrate that they can use their respirators correctly

Instruct workers to use good personal hygiene

The employer should encourage workers to:

- thoroughly clean and bandage all scratches or abrasions while at work. Keep wounds covered with clean, dry bandages. (Encourage workers who have lacerations or penetrating wounds to get medical attention as soon as possible.)
- avoid rubbing or touching their eyes, mouths, noses, ears, or other body parts with contaminated hands. Keep hands as clean as possible.
- not bite their fingernails, chew toothpicks, and so forth
- wash their hands and face before smoking, eating, drinking, or using the toilet. If clean water is not available, use commercially available sterile alcohol wipes.
- at the end of the shift, thoroughly wash their hands and all exposed skin
- clean rubber boots, aprons, and gloves with solution of bleach diluted at 1:10 after use
- sanitize respirators and store them in a clean place before using them again
- remove contaminated cloth coveralls and other work clothing at the end of the shift and leave them at work. Clothing must be washed in hot water and industrial detergent before using. Never wash work and family laundry together.
- shower and change as soon as possible after each shift
- store work and street clothing separately; also keep clean and used work clothing separate

Provide competent supervision

The employer should make sure that managers and supervisors are qualified by training and experience to carry out their responsibilities. Their responsibilities include:

- understanding and ensuring compliance with workplace health and safety requirements
- making sure hazards are identified and proper steps are taken to control the risks
- inspecting work areas and correcting unsafe acts and conditions
- instructing and coaching workers to follow safe work procedures
- ensuring only authorized, competent workers operate equipment
- ensuring equipment is properly maintained
- ensuring the necessary personal protective equipment is provided to workers and used properly
- understanding and implementing emergency procedures
- reporting and investigating accidents and near accidents
- promoting health and safety awareness
- co-operating with other parties in dealing with health and safety issues

Prepare for emergencies

The employer, worker occupational health and safety representative, or the occupational health committee needs to think about how to respond to an emergency and treat injured workers.

Develop first aid plans

Anyone can be overcome by hydrogen sulphide. When this happens, it is critical that first aid and CPR be given at once. Therefore, the regulations require that trained personnel be readily available at the site to conduct a rescue. **At least one Class A First Aid attendant must be present.**

A first aid box meeting the requirements of Table 10 of the Appendix to *The Occupational Health and Safety Regulations, 1996* must be onsite and readily available to workers. Table 9 of the Appendix to the regulations specifies what additional first aid requirements are needed, depending on how close the work site is to a medical facility.

Develop emergency response plans

Consider issues such as:

- what emergencies are likely to occur
- who will be affected, where, and when
- what resources will be required to undertake a rescue
- how injured workers will be treated and transported to a medical facility
- what resources and outside emergency services will be required

Think about how accidents and injuries will be investigated and who will prepare any required notifications and reports.

Notes

Address specific hazards

- Control the risks of confined spaces
- Control biohazards
- Prevent falls

Introduction

The last chapter dealt with how to set up a health and safety system to protect workers. This chapter discusses how the employer can deal with hazards associated with many workplace accidents. Inspections, contacts with workers, and so forth should also be used to identify and control other workplace hazards.

Control the risks of confined spaces

The employer's health and safety management system must include a plan to protect any worker who must work in a work area or confined space where hydrogen sulphide is a concern.

Types of confined space defined in the regulations

A **"confined space"** means an enclosed or partially enclosed space that:

1. is not primarily designed or intended for human occupancy, except for the purpose of performing work; and
2. has restricted means of entrance and exit.

A **"hazardous confined space"** means a confined space that is or may become hazardous to a worker entering the confined space due to:

- the design, construction or atmosphere of the confined space;
- the materials or substances in the confined space;
- the work activities or processes used in the confined space; or
- any other conditions relating to the confined space.

Truck mounted tanks or above ground storage tanks being used to hold liquid manure must be treated as "hazardous confined spaces".

If a worker must enter a *hazardous confined space,* the employer (with the representative or committee) must develop an entry plan as described in Part XVIII of the regulations.

General requirements for hazardous confined spaces

The employer must make sure that:

- all workers who are required to enter a hazardous confined space are trained in the plan's requirements
- competent supervisors oversee the plan
- supervisors and workers carry out their responsibilities properly

Assess the hazards by testing

Before a worker is required or permitted to enter a confined space, an employer shall appoint a *competent person* to assess the hazards. (A person must have the required training, knowledge, and experience before being deemed *competent.*)

If a hazardous atmosphere is identified, test it for:

- too little oxygen
- flammable or explosive substances
- concentrations of hazardous airborne chemicals, especially hydrogen sulphide

The competent person must then determine whether:

- work will result in the release of toxic, flammable, or explosive concentrations of any substances while workers are in the confined space
- appropriate measures have been taken to prevent anyone in the confined space from suffocating or becoming trapped in liquids or other substances
- hazards from biological substances in the confined space are removed or controlled
- the openings and exits of the confined space are large enough to allow workers using personal protective equipment to get in and out safely

Only suitable and properly calibrated instruments may be used to test the atmosphere in the confined space.

The competent person doing the testing must prepare a written report setting out:

- the results of the assessment, tests, and so forth
- precautions and safe work procedures that must be followed by workers entering and leaving the confined space
- personal protective equipment that should be used

Develop an entry plan

Where workers must enter a hazardous confined space, the employer must develop a *hazardous confined space entry plan*. The plan must:

- be in writing
- state what tests or measurements are necessary to monitor oxygen levels or the presence of hazardous concentrations of flammable or explosive substances
- identify any other hazards that may be present
- state how the confined space will be ventilated
- list required safe work procedures for entering, working in, and getting out of the hazardous confined space safely
- state the required personal protective equipment, including its availability, location, and proper use
- describe rescue procedures — including how many rescuers must be available, their duties, and the availability, location, and proper use of equipment
- describe how communication will be maintained with workers in the confined space
- describe any other equipment that a worker may need to work safely in the hazardous confined space, including its availability, location, and proper use

Train workers

The employer must make sure that the following workers are trained in and follow the hazardous confined space entry plan:

- any worker who is required or permitted to enter the hazardous confined space
- any worker who attends a worker in the hazardous confined space pursuant to regulation 274(4) or 274(5)
- any worker who may be required or permitted to implement the rescue procedures

The employer must make a copy of a hazardous confined space entry plan readily available to all workers.

Purge and ventilate where required

Where a toxic, flammable, or explosive substance is present, or where there is too little oxygen in a hazardous confined space, the employer must make sure that the space is purged and ventilated before anyone is allowed to enter.

This procedure must make sure that:

- hazards posed by any toxic, flammable, or explosive substances are eliminated or reduced as much as possible
- an oxygen content of not less than 19.5 percent and not more than 23 percent is ensured
- the space is continuously ventilated at all times and a safe atmosphere maintained as long as anyone is inside the hazardous confined space

Test the atmosphere

Where purging and ventilation are used to reduce or eliminate a hazard, the employer must make sure that a competent person tests the atmosphere to determine that the confined space is safe to enter. This must be done:

- before a worker enters the confined space
- where all workers have left the confined space, and before any workers re-enter
- when requested by a worker who will enter the confined space
- continuously where any condition in the confined space may change and put a worker's health or safety at risk

Testing is not required if the tank has been thoroughly cleaned and the worker entering the tank is provided with an air-supplied respirator with an escape bottle. There must be enough air in the air bottle for the length of time the work is to be performed.

Use other methods to protect workers when it is not possible to provide a safe atmosphere

Where a hazardous confined space cannot be purged and ventilated properly, or where a safe atmosphere cannot be maintained, the employer **must make sure that** no work is carried on in the hazardous confined space, unless:

1. A competent person continuously monitors the atmosphere in the hazardous confined space; and
2. Any worker entering the confined space wears a suitable atmosphere supplying respirator if:
    - contamination limits set out in regulation 307(1)(a) are exceeded
    - oxygen levels are too low
    - airborne concentrations of any other substances may be harmful

Provide communication with workers in the confined space

The employer must make sure that any worker in a hazardous confined space is attended by and in communication with another worker who:

- has been adequately trained in the rescue procedures
- is stationed and remains at the entrance to the confined space unless replaced by another adequately trained worker
- is equipped with a suitable alarm to summon help

Provide a full-body harness and lifeline where workers enter the confined space from the top

If the hazardous confined space's entrance is at the top, the employer must make sure that:

- any worker entering the confined space uses a full-body harness and, where appropriate, is attached to a lifeline
- if a lifeline is used, it is attended by another worker who is adequately trained in the rescue procedures
- where reasonably practicable, a mechanical lifting device to assist with a rescue is located at the entry while a worker is in the confined space

The employer can use another rescue method if using a full-body harness or lifeline could be hazardous.

Control sources of ignition

If flammable or explosive dusts, gases, vapours, or liquids are or may be present, the employer must make sure that all sources of ignition are eliminated or controlled.

The employer must make sure that:

- equipment needed to rescue workers is readily available at the entrance to the hazardous confined space and is used in accordance with the employer's rescue procedures
- a worker with a Class A first aid qualification is available to provide immediate first aid
- trained rescuers, who are fully informed of the hazards in the confined space, are readily available to help with a rescue if one is needed

Protect workers working with manure in pits and tanks

Don't forget that empty tanks that have carried effluent are also *hazardous confined spaces*. Toxic gases (from hydrogen sulphide, ammonia, and other substances) and biohazards may be present.

Control biohazards

The employer must develop a written infection control plan that meets the requirements of regulation 85. This plan can be integrated into any existing written procedures and policies. The plan must:

1. Identify which workers may inhale, ingest or otherwise contact manure or be exposed to infectious materials or organisms.
2. Explain how workers may contact infectious materials or organisms and how microorganisms enter the body. (See the section *Biohazards*, page 5.)
3. State the signs and symptoms of any diseases that may result from exposure. (See the following chart.)

Disease	Means Of Exposure (with infected manure) That May Cause Infection	Time From Exposure Until Symptoms Appear	Signs and Symptoms
Erysipeloid	Direct skin contact	1-7 days	Painful, burning and/or itching, red and possibly blistered rash; may lead to fever, fatigue, headache, and muscle pain
Streptococci spp	Inhalation, direct skin contact, oral intake	1-3 days	Skin infection and/or rash, fever, pneumonia, sore throat; may be followed by complications that affect a number of internal organs
Listeria monocytogenes	Direct skin contact; less likely by inhalation or oral intake	Uncertain — possibly 3 days to 3 weeks	Skin lesions, possibly abortion or stillbirth in a pregnant worker; can cause more severe effects in persons with compromised immune function
Aspergillus and a few other fungi	Inhalation	A few days to weeks	Pneumonia in persons with compromised immune systems
Enterohaemorrhagic E coli 0157:H7	Oral intake	24-72 hours	Watery diarrhea, abdominal cramps, vomiting; may lead to dehydration, fever, kidney failure, and effects on brain function
Leptospira interrogans	Direct skin contact or inhalation; less likely by oral intake	2-30 days; usually 7-12 days	Fever, headache, chills, fatigue, vomiting, muscle pain, eye infection; may affect renal function and lead to meningitis, jaundice, anaemia; may be an infection with no symptoms
Hepatitis A	Oral intake	15-50 days; average 28-30 days	May be no symptoms with the infection; may have an abrupt onset with fever, fatigue, weight loss, nausea, abdominal pain; may develop into jaundice; symptoms may be prolonged or chronic and become disabling
Clostridia tetani	Contamination of a (usually deep) wound	3-21 days; average 10 days	Painful muscle contractions and spasms of muscles especially in the neck; can lead to rigidity and death by asphyxiation
Intestinal bacteria such as species of Salmonella and some strains of E. coli	Oral intake	6 hours to 3 days typically	Abdominal pain, diarrhea, nausea, vomiting and possibly dehydration.

4. State what infection control measures must be followed, and their limitations, including:
   - engineering controls to minimize the release of aerosolized manure into the work environment and prevent unneeded exposure
   - safe work practices and procedures to reduce skin contact with liquid manure and exposure to aerosolized manure
   - personal protective equipment (gloves, coveralls, respirators)
5. Set out procedures to be followed where a worker has been exposed or believes he or she has been exposed to manure in a manner and to the extent that could result in harmful effects.
6. Provide written work procedures for cleaning, disinfecting, or disposing of clothing, personal protective equipment, or other equipment contaminated with an infectious material or organism and that states 'who is responsible for what'.
7. State what training will be provided, and how, to workers who are at risk. Training should include:
   - the hazards of handling liquid manure
   - safe work procedures
   - the need to wear personal protective clothing and equipment and use good personal hygiene
8. Require that exposures and confirmed occupationally acquired infections be investigated and documented. Investigations must identify:
   - the route of exposure
   - the circumstances that led to the exposure
   - measures to prevent future exposures

The employer implements the plan, reviews its adequacy with the representative or committee at least once every two years, and updates it when necessary. The employer must also:

- make a current copy of the plan available to every worker who may be exposed to an infectious material or organism
- inform workers who may be exposed of any vaccines recommended by public health communicable disease authorities, and the risks of those vaccines

Make sure that workers are properly immunized

The immunization schedule recommended for sewer workers applies to liquid manure handlers. These recommendations are:

- **Tetanus and Diphtheria** – The employer should make sure that each worker has completed their primary immunization (three doses) and has had an immunization booster in the last ten years. If a worker receives a Tetanus-prone wound, a consultation with a physician and a booster may be needed.
- **Polio** – The employer should encourage workers to determine if they were immunized as children. Advise workers who were not that vaccines for adults are available.
- **Hepatitis A** – Persons who handle human sewage may be at increased risk of Hepatitis A infection when outbreaks occur in the community. However, current evidence is not sufficient to require employers to ensure that all workers handling sewage are offered the Hepatitis A vaccinations, but the employer should inform workers that the vaccine is available and what protection it provides.

The employer must arrange for each worker to receive recommended vaccinations during normal working hours and/or reimburse each worker for any associated costs. Where a worker cannot receive a vaccination during normal working hours, the employer must credit the time spent getting a vaccination after work as time at work and ensure that the worker does not lose any pay or benefits.

Workers should tell their doctors that they handle manure and promptly report any health problems of concern.

Controlling exposure to biohazards and disinfectants during high-pressure washing

Workers can inhale contaminated particles while cleaning pits, tanks, and other areas with high-pressure hoses. They can also inhale harmful chemical mists if disinfectant is run through high pressure washing equipment. To protect workers and supervisors, the employer can:

- provide fog-proof goggles or face shields
- prevent workers and supervisors from using high pressure when washing with disinfectants — require them to use low-pressure equipment for disinfecting instead
- require workers and supervisors to use appropriate cartridge respirators when spraying disinfectants that may give off harmful vapours or aerosols

Prevent falls

The employer must protect workers from falling by putting up barriers or requiring workers to use fall prevention equipment.

Prevent falls on tanker trucks

Workers performing tasks on top of truck tanks (such as operating tank flushing equipment) must be protected from falling. Options include:

- purchasing trucks with built-in walkways with guard rails or grab rails
- developing work procedures
- providing appropriate travel-limiting devices and requiring workers to use them
- installing guardrails
- providing and requiring workers to use fall-arresting devices with full body harnesses, lifelines, and connecting linkages

These precautions must also be taken for work done at the top of above ground storage tanks.

Prevent falls in lagoons, tanks, and pits

Lagoons often have impervious membrane liners and sidewalls. These become extremely slippery and make it difficult for anyone falling in to escape.

The employer must take all reasonably practicable measures to prevent workers from falling into lagoons. Where workers work close to lagoons, the employer must provide travel-limiting gear (such as a safety belt and lifeline). Supervisors must enforce its use and workers must wear it.

Appendix

- Legislation
- Resources

Legislation

Use this section to review the legislation that applies to this guide.

The Occupational Health and Safety Act, 1993

Establishment of committees

15(1) Subject to the regulations, at every place of employment where 10 or more workers of one employer work, the employer shall:

(a) establish an occupational health committee at the place of employment; and

(b) designate persons as members of the occupational health committee in accordance with this section.

(2) An occupational health committee must consist of at least two and no more than 12 persons.

(3) At least half of the members of an occupational health committee must represent workers other than workers connected with the management of the place of employment.

(4) No person may be designated as a member of an occupational health committee who represents workers unless the person:

(a) has been elected from the place of employment for that purpose by the workers whom the person would represent;

(b) has been appointed from the place of employment in accordance with the constitution of the trade union of which the workers are members; or

(c) where more than one trade union represents the workers that the person would represent on the committee, has been appointed for that purpose from the place of employment pursuant to an agreement among all of those trade unions.

Designation of representatives

16(1) Subject to the regulations, at each prescribed place of employment where less than 10 workers of one employer work, the employer shall designate a person as the occupational health and safety representative for those workers.

(2) No person may be designated as an occupational health and safety representative unless the person:

(a) has been elected from the place of employment for that purpose by the workers whom the person would represent;

(b) has been appointed from the place of employment in accordance with the constitution of the trade union of which the workers are members; or

(c) where more than one trade union represents the workers that the person would represent as an occupational health and safety representative, has been appointed for that purpose from the place of employment pursuant to an agreement among all of those trade unions.

Duties of committees

19 The duties of an occupational health committee are:

(a) to participate in the identification and control of health and safety hazards in or at the place of employment;

(b) to co-operate with the occupational health and safety service, if any, established for the place of employment;

(c) to establish, promote and recommend the means of delivery of health and safety programs for the education and information of workers;

(d) to maintain records with respect to the duties of the committee pursuant to this section;

(e) to investigate any matter mentioned in section 23;

(f) to receive, consider and resolve matters respecting the health and safety of workers;

(g) to carry out any other duties that are specified in this Act or prescribed in the regulations.

Duties of representatives

20 The duties of an occupational health and safety representative are the following, to be done in consultation with the employer:

(a) to participate in the identification and control of health and safety hazards in or at the place of employment;

(b) to co-operate with the occupational health and safety service, if any, established for the place of employment;

(c) to receive and distribute to workers information regarding health and safety;

(d) to receive, consider and resolve matters respecting the health and safety of workers;

(e) to carry out any other duties that are specified in this Act or prescribed in the regulations.

(2)(1)(l) **"competent"** means possessing knowledge, experience and training to perform a specific duty;

(2)(1)(m) **"competent worker"**, with respect to a particular task or duty, includes a worker who is being trained to perform that task or carry out that duty and who is under close and competent supervision during that training;

Supervision of work

17(1) An employer or contractor shall ensure that:

(a) all work at a place of employment is sufficiently and competently supervised;

(b) supervisors have sufficient knowledge of all of the following with respect to matters that are within the scope of the supervisor's responsibility:

(i) the Act and any regulations made pursuant to the Act that apply to the place of employment;

(ii) any occupational health and safety program at the place of employment;

(iii) the safe handling, use, storage, production and disposal of chemical and biological substances;

(iv) the need for, and safe use of, personal protective equipment;

(v) emergency procedures required by these regulations;

(vi) any other matters that are necessary to ensure the health and safety of workers under their direction; and

(c) supervisors comply with the Act and any regulations made pursuant to the Act that apply to the place of employment and ensure that the workers under their direction comply with the Act and those regulations.

(2) A supervisor shall ensure that the workers under the supervisor's direction comply with the Act and any regulations made pursuant to the Act that apply to the place of employment.

Duty to inform workers

18 An employer shall ensure that each worker:

(a) is informed of the provisions of the Act and any regulations pursuant to the Act that apply to the worker's work at the place of employment; and

(b) complies with the Act and those regulations.

Training of workers

19(1) An employer shall ensure that a worker is trained in all matters that are necessary to protect the health and safety of the worker when the worker:

(a) begins work at a place of employment; or

(b) is moved from one work activity or worksite to another that differs with respect to hazards, facilities or procedures.

(2) The training required by subsection (1) must include:

(a) procedures to be taken in the event of a fire or other emergency;

(b) the location of first aid facilities;

(c) identification of prohibited or restricted areas;

(d) precautions to be taken for the protection of the worker from physical, chemical or biological hazards;

(e) any procedures, plans, policies and programs that the employer is required to develop pursuant to the Act or any regulations made pursuant to the Act that apply to the worker's work at the place of employment; and

(f) any other matters that are necessary to ensure the health and safety of the worker while the worker is at work.

(3) An employer shall ensure that the time spent by a worker in the training required by subsection (1) is credited to the worker as time at work, and that the worker does not lose pay or other benefits with respect to that time.

(4) An employer shall ensure that no worker is permitted to perform work unless the worker:

(a) has been trained, and has sufficient experience, to perform the work safely and in compliance with the Act and the regulations; or

(b) is under close and competent supervision.

Designation of committee members

39(1) An employer or contractor who is required to establish a committee shall:

(a) in designating the members:

(i) select persons to represent the employer or contractor on the committee; and

(ii) ensure that there is a sufficient number of members representing workers on the committee to equitably represent groups of workers who have substantially different occupational health and safety concerns; and

(b) designate members for a term not exceeding three years.

(2) Members of a committee hold office until a successor is designated, and may be re-designated for a second or subsequent term.

Frequency of meetings

41(1) Subject to subsection (2), a committee shall:

(a) hold its first meeting within two weeks after being established;

(b) hold three subsequent meetings at intervals not exceeding one month; and

(c) after that, hold regular meetings at intervals not exceeding three months.

(2) The director may require a committee to meet more frequently than sub-section (1) requires because of any of the following factors at the place of employment:

(a) the existence of particular hazards or circumstances;

(b) the complexity of the operation;

(c) the number of workers.

Special meetings

44 Either co-chairperson may call a special meeting of a committee to deal with urgent concerns, imminent dangers to health or safety, investigations of accidents or dangerous occurrences or refusals to work pursuant to section 23 of the Act.

Designation of representative

45(1) On and after July 1, 1997, the places of employment set out in Table 7 of the Appendix where more than four but fewer than 10 workers of one employer work are prescribed for the purposes of section 16 of the Act.

(2) An employer at a place of employment described in subsection (1) shall designate a representative for the workers at that place of employment not later than the day on which the place of employment is prescribed pursuant to sub-section (1).

Training of representatives, committee members

46(1) At a place of employment where a representative is designated, an employer shall ensure that the representative receives training respecting the duties and functions of a representative.

(2) At a place of employment where a committee is established, an employer or contractor shall ensure that the co-chairpersons of the committee receive training respecting the duties and functions of a committee.

(3) Where a member of a committee or a representative gives reasonable notice, an employer or contractor shall permit the member or representative to take leave for a period or periods of not more than five working days per year to attend occupational health and safety training programs, seminars or courses of instruction.

(4) Where a member of a committee or a representative attends a training program, seminar or course of instruction on health and safety matters conducted or provided by the division or by an approved training agency, an employer or contractor shall credit the member's or representative's attendance as time at work and ensure that the member or representative loses no pay or other benefits.

Meetings of employers and representatives

47(1) At a place of employment where a representative is designated, an employer shall meet with the representative regularly to discuss health and safety matters.

(2) A representative may call a special meeting with an employer to deal with urgent concerns, imminent dangers to health or safety or investigations of accidents or dangerous occurrences.

Opportunity for necessary activities

48(1) An employer or contractor shall ensure that:

(a) the members of a committee or a representative are allowed to examine any log book, inspection report or other record that the employer or contractor is required to keep at the place of employment pursuant to the Act or any regulations made pursuant to the Act;

(b) members of a committee or a representative have reasonable opportunity, during normal working hours and without loss of pay or other benefits, to receive and investigate concerns, to inform workers of the provisions of the Act or any regulations made pursuant to the Act or to conduct other business proper to the functioning of the committee or the representative;

(c) members of a committee have reasonable opportunity to hold a special meeting pursuant to section 44 at any time; and

(d) a representative has reasonable opportunity to hold a special meeting pursuant to subsection 47(2) at any time.

(2) An employer or contractor shall ensure that no member of a committee or representative who participates in a regular meeting held pursuant to section 41 or subsection 47(1) or in a special meeting held pursuant to section 44 or 49 or subsection 47(2) loses any pay or other benefits as a result of that participation.

Personal washing

72 An employer, contractor or owner shall provide and maintain for the use of workers suitable facilities for personal washing that:

(a) are located near each toilet at a place of employment;

(b) have a supply of clean hot and cold water or warm water, soap and clean towels or other suitable means of cleaning and drying;

(c) have an easily cleanable, covered receptacle for waste materials;

(d) are adequately heated, ventilated and lighted; and

(e) are kept in a clean and neat condition.

Clothing

73(1) Subject to subsection (2), an employer, contractor or owner shall provide at a place of employment and maintain for the use of workers clean, appropriately located and suitable accommodation for street clothing that is not worn at work and for clothing worn at work.

(2) Where street clothing not worn at work is likely to become wet, dirty or contaminated from being kept in the same accommodation as clothing worn at work, the accommodation for street clothing must be separate from the accommodation provided for clothing worn at work.

(3) Where a worker's work clothing or skin is likely to be contaminated by hazardous or offensive substances, an employer or contractor shall:

(a) provide protective clothing and head cover appropriate to the work and hazard;

(b) provide a suitable changing area; and

(c) ensure that the clothing and head cover is handled and cleaned or disposed of in a manner that will prevent worker exposure to hazardous or offensive substances.

Change and shower facilities

74 Where a worker's skin is likely to be contaminated by harmful or offensive substances as part of the regular work processes at a place of employment, an employer, contractor or owner shall:

(a) where reasonably practicable, provide and maintain suitable, adequate and clean change and shower facilities; and

(b) allow sufficient time, during normal working hours without loss of pay or other benefits, for the worker to use the facilities.

Eating areas

75(1) An employer, contractor or owner shall provide sufficient, suitable areas that are kept clean, dry, thermally comfortable and reasonably quiet for workers to eat and drink during work breaks.

(2) At places of employment where the substances used in the work or the work processes are dusty, dirty or otherwise likely to contaminate a worker's person, clothing or food, the employer, contractor or owner shall provide an eating area that is separate from the worksite and close to washing facilities.

Drinking water

76(1) An employer, contractor or owner shall provide, at suitable points that are readily accessible to all workers, an adequate supply of clean and safe drinking water.

(2) Where the supply of drinking water at a place of employment is not piped, an employer, contractor or owner shall:

(a) provide drinking water in suitable covered containers;

(b) protect the drinking water from contamination; and

(c) change the drinking water as often as is necessary to ensure that the water is clean and safe to drink.

(3) Except where drinking water is supplied in an upward jet, an employer, contractor or owner shall provide an adequate supply of disposable cups near each supply of drinking water.

(4) Where it is necessary to identify the supply of drinking water, an employer, contractor or owner shall clearly indicate the supply of drinking water with a sign that says "Drinking Water" or by another visual means.

(5) Where there is a supply of water at a place of employment that is unfit for drinking, an employer, contractor or owner shall clearly indicate the supply of water with a permanently fixed, durable sign that says "Unfit for Drinking" or by another visual means.

Exposure to infectious materials, organisms

85(1) In this section:

(a) **"expose"** means harmful contact through inhalation, ingestion or absorption through the skin;

(b) **"infectious material or organism"** means an infectious material or organism set out in Table 14 of the Appendix.

(2) Where workers are required to handle, use or produce an infectious material or organism or are likely to be exposed to an infectious material or organism at a place of employment, an employer, in consultation with the committee, shall develop a written plan that:

(a) identifies any workers at the place of employment who may be exposed to infectious materials or organisms;

(b) describes the ways in which an infectious material or organism can enter the body of a worker and the risks associated with that entry;

(c) describes the signs and symptoms of any disease that may arise from exposure to an infectious material or organism to which a worker may be exposed at the place of employment;

(d) describes infection control measures, including the following, and their limitations:

(i) vaccination;

(ii) engineering controls;

(iii) personal protective equipment;

(iv) safe work practices and procedures; and

(v) the use of universal blood and body fluid precautions where there is a risk of worker exposure to blood or potentially infectious body fluids;

(e) sets out procedures to be followed where:

(i) there has been a spill or leak of an infectious material or organism;

(ii) a worker has been exposed to an infectious material or organism; or

(iii) a worker believes that he or she has been exposed to an infectious material or organism;

(f) sets out methods of cleaning, disinfecting or disposing of clothing, personal protective equipment or other equipment contaminated with an infectious material or organism to be followed and indicates who is responsible for carrying out those activities;

(g) describes the training that will be provided to workers who may be exposed to infectious materials or organisms and the means by which this training will be provided;

(h) requires the investigation and documentation of any work-related exposure incident, including the route of exposure and the circumstances under which the exposure occurred; and

(i) requires the investigation of any occurrence of an occupationally transmitted infection or infectious disease to identify the route of exposure and to implement measures to prevent further infection.

(3) An employer shall implement a plan developed pursuant to subsection (2).

(4) An employer, in consultation with the committee, shall review the adequacy of a plan required by subsection (2) at least every two years and amend the plan where necessary.

(5) An employer shall:

(a) make a copy of a plan required by subsection (2) and any amendments to that plan available to every worker who may be exposed to an infectious material or organism;

(b) inform workers who may be exposed to an infectious material or organism of:

(i) any vaccine recommended for workers for that risk in the *Canadian Immunization Guide* published by Health and Welfare Canada and by:

(A) a medical health officer appointed pursuant to *The Public Health Act* or a designated public health officer within the meaning of *The Public Health Act, 1994* whose powers and responsibilities include those set out in Part IV of *The Public Health Act, 1994*; or

(B) a physician with expertise in immunization or the control of communicable diseases; and

(ii) the risks associated with taking a vaccine mentioned in sub-clause (i);

(c) with the worker's consent, arrange for a worker to receive any vaccination recommended pursuant to subclause (b)(i) during the worker's normal working hours and reimburse the worker for any costs associated with receiving the vaccination; and

(d) where a worker cannot receive a vaccination mentioned in clause (b) during the worker's normal working hours, credit the worker's attendance for the vaccination as time at work and ensure that the worker does not lose any pay or other benefits.

(6) Where a worker has been exposed to blood or potentially infectious body fluids at a place of employment, an employer shall, on the request of the worker, arrange for confidential post-exposure counselling, medical evaluation or medical intervention to be provided during the worker's normal working hours by a qualified person in a manner that is acceptable to the Department of Health.

(7) Where a worker cannot receive post-exposure counselling, medical evaluation or medical intervention during the worker's normal working hours, an employer shall credit the worker's attendance for counselling, evaluation or intervention as time at work and shall ensure that the worker does not lose any pay or other benefits.

General responsibilities

87(1) Where an employer or contractor is required by these regulations or any other regulations made pursuant to the Act to provide personal protective equipment, the employer or contractor shall:

(a) supply approved personal protective equipment to the workers at no cost to the workers;

(b) ensure that the personal protective equipment is used by the workers;

(c) ensure that the personal protective equipment is at the worksite before work begins;

(d) ensure that the personal protective equipment is stored in a clean, secure location that is readily accessible to workers;

(e) ensure that each worker is aware of the location of the personal protective equipment and trained in its use;

(f) inform the workers of the reasons why the personal protective equipment is required to be used and of the limitations of its protection; and

(g) ensure that personal protective equipment provided to a worker:

(i) is suitable and adequate and a proper fit for that worker;

(ii) is maintained and kept in a sanitary condition; and

(iii) is removed from use or service when damaged.

(2) Where an employer or contractor requires a worker to clean and maintain personal protective equipment, the employer shall ensure that the worker has adequate time during normal working hours without loss of pay or other benefits for this purpose.

(3) Where reasonably practicable, an employer or contractor shall make appropriate adjustments to the work procedures and the rate of work to eliminate or reduce the danger or discomfort to the worker that may arise from the worker's use of personal protective equipment.

(4) A worker who is provided with personal protective equipment by an employer or contractor shall:

(a) use the personal protective equipment; and

(b) take reasonable steps to prevent damage to the personal protective equipment.

(5) Where personal protective equipment provided to a worker becomes defective or otherwise fails to provide the protection it was intended for, the worker shall:

(a) return the personal protective equipment to the employer or contractor; and

(b) inform the employer or contractor of the defect or other reason why the personal protective equipment does not provide the protection that it was intended to provide.

(6) An employer or contractor shall immediately repair or replace any personal protective equipment returned to the employer or contractor pursuant to clause (5)(a).

Respiratory protective devices

88(1) Where a worker is likely to be exposed to dust, fumes, gas, mist, aerosol or vapour or any contaminant that may be present in any amounts that are harmful or offensive to the worker, an employer or contractor shall:

(a) provide a suitable and adequate approved respiratory protective device for use by the worker with a facepiece that is the proper size and, where a tight fit is essential to the proper functioning of the respiratory protective device, makes an effective seal to the facial skin of the worker;

(b) ensure that the respiratory protective device is regularly cleaned and maintained in an approved manner; and

(c) ensure that the respiratory protective device is kept, when not in use, in a convenient and sanitary location in which the respiratory protective device is not exposed to extremes of temperature or to any contaminant that may inactivate the respiratory protective device.

(2) An employer or contractor shall ensure that a worker who is required to use a respiratory protective device:

(a) is adequately trained by a competent person in the proper testing, maintenance, use and cleaning of the respiratory protective device and in its limitations;

(b) demonstrates that the worker:

(i) understands the training provided pursuant to clause (a);

(ii) can test, maintain and clean the respiratory protective device; and

(iii) can use the respiratory protective device safely; and

(c) tests the respiratory protective device before each use.

(3) The training required by clause (2)(a) must include practical experience by the worker in an uncontaminated environment.

(4) Where respiratory protective devices are used only for emergency purposes, an employer or contractor shall ensure that a worker who may be required to use a respiratory protective device is given semi-annual refresher training in its safe use.

Inspection of respiratory protective devices

89 An employer or contractor shall ensure that:

(a) any respiratory protective device for emergency use is thoroughly inspected by a competent person at least once a month and after each use;

(b) the date of every inspection made pursuant to clause (a) and the name of the person who made the inspection are recorded and conspicuously displayed at the location where the respiratory protective device is stored; and

(c) any defects identified during the inspection carried out pursuant to clause (a) are corrected immediately by a competent person.

Working in dangerous atmospheres

90(1) Where a worker is required to enter an atmosphere that is immediately dangerous to the life or health of the worker, an employer or contractor shall ensure that the worker is provided with and uses an approved atmosphere-supplying respirator that is:

(a) an open-circuit SCBA that:

(i) operates in a pressure demand or other positive pressure mode;

(ii) has a minimum rated capacity of 30 minutes;

(iii) is sufficiently charged to enable the worker to perform the work safely; and

(iv) is equipped with a low-pressure warning device or an escape respirator;

(b) an airline respirator equipped with a full facepiece that:

(i) operates in a pressure demand or other positive pressure mode; and

(ii) has an auxiliary supply of air sufficient to allow the worker to escape in case of failure of the primary air supply equipment; or

(c) a closed-circuit SCBA.

(2) Where a worker is required to enter an atmosphere that is immediately dangerous to life or health, an employer or contractor shall ensure that:

(a) a second worker, suitably equipped and trained, is present and in communication with the worker at all times; and

(b) suitably equipped personnel who are trained in rescue procedures and are fully informed of the hazards are readily available to rescue the endangered worker immediately if the worker's atmosphere-supplying respirator fails or the worker becomes incapacitated for any other reason.

(3) An employer or contractor shall ensure that compressed air in an atmosphere-supplying respirator used by a worker in an atmosphere that is immediately dangerous to the worker's life or health meets the purity requirements set out in Table 2 of the Canadian Standards Association standard CAN3-Z180.1-M85 *Compressed Breathing Air and Systems*.

Safety belts

100 Where these regulations require the use of a safety belt, an employer or contractor shall ensure that:

(a) the safety belt and connecting linkage are approved and maintained;

(b) the safety belt is properly fitted to the worker;

(c) all metal parts of the safety belt and connecting linkage are of drop-forged steel 17.8 kilonewtons proof tested;

(d) a protective thimble is used to protect ropes or straps from chafing whenever a rope or strap is connected to an eye or a D-ring used in the safety belt or connecting linkage; and

(e) the connecting linkage is attached to a fall-arresting device, lifeline or fixed anchor to prevent the worker from falling more than 1.2 metres.

Lifelines

101(1) Unless otherwise specifically provided, where these regulations require the use of a lifeline, an employer or contractor shall ensure that the lifeline:

(a) is suitable for the conditions in which the lifeline is to be used, having regard to factors including strength, abrasion resistance, extensibility and chemical stability;

(b) is made of wire rope or synthetic material;

(c) is free of imperfections, knots and splices, other than end terminations;

(d) is protected by padding where the lifeline passes over sharp edges;

(e) is protected from heat, flame or abrasive or corrosive materials during use;

(f) is fastened to a secure anchor point that:

(i) has a breaking strength of at least 17.8 kilonewtons; and

(ii) is not used to suspend any platform or other load; and

(g) is maintained.

(2) Unless otherwise specifically provided, an employer or contractor shall ensure that a vertical lifeline required by these regulations has a minimum diameter of:

(a) 12 millimetres if the lifeline is made of nylon;

(b) 15 millimetres if the lifeline is made of polypropylene; or

(c) eight millimetres if the lifeline is made of wire rope.

(3) An employer or contractor shall ensure that where a vertical lifeline is used:

(a) the lower end extends to the ground or to a safe landing; and

(b) the lifeline is protected at the lower end to ensure that the line cannot be fouled by any equipment.

(4) Unless otherwise specifically provided, an employer or contractor shall ensure that a horizontal lifeline is designed and certified as safe by a professional engineer and installed and used in accordance with that design.

Fall-arresting devices

102(1) An employer or contractor shall ensure that a fall-arresting device and connecting linkage required by these regulations is approved and maintained.

(2) An employer or contractor shall ensure that a fall-arresting device required by these regulations:

(a) prevents a worker from falling more than 1.2 metres, excluding the increase in total fall distance resulting from the use of a shock absorber;

(b) applies a peak fall-arrest force not greater than eight kilonewtons to a worker; and

(c) is fastened to a lifeline or to a secure anchor point that has a breaking strength of at least 17.8 kilonewtons.

Full-body harness

103 Where a full-body harness is required by these regulations, an employer or contractor shall ensure that:

(a) the full-body harness and connecting linkage are approved and maintained;

(b) the full-body harness is properly fitted to the worker;

(c) the worker is trained in the safe use of the full-body harness; and

(d) the worker inspects the full-body harness daily or before each use.

Snap hooks on safety belts, etc.

104 Where a snap hook is used as an integral component of a safety belt, connecting linkage, fall-arresting device, full-body harness or lifeline, an employer or contractor shall ensure that the snap hook is self-locking and is approved and maintained.

Lanyards

105 An employer or contractor shall ensure that a lanyard:

(a) is as short as work conditions permit;

(b) is constructed of:

(i) nylon, polyester or polypropylene rope or webbing; or

(ii) wire rope that is equipped with an approved shock absorbing device;

(c) is equipped with suitable snap hooks; and

(d) is approved and maintained.

Workers' responsibilities re lifelines, etc.

106(1) Before using a lifeline or lanyard, a worker shall ensure that the lifeline or lanyard:

(a) is free of imperfections, knots and splices, other than end terminations;

(b) is protected by padding where the lifeline or lanyard passes over sharp edges; and

(c) is protected from heat, flame or abrasive or corrosive materials during use.

(2) Before using a vertical lifeline, a worker shall ensure that:

(a) the lower end extends to the ground or to a safe landing; and

(b) the lifeline is protected at the lower end to ensure that the line cannot be fouled by any equipment.

(3) Before using a safety belt or a full-body harness, a worker shall ensure that the safety belt or full-body harness:

(a) is properly adjusted to fit the worker securely; and

(b) subject to subsection 274(5), is attached by means of a connecting linkage to a fixed anchor or a lifeline.

(4) A worker who uses a safety belt or a full-body harness and connecting linkage shall ensure that the connecting linkage is attached to a fall-arresting device, lifeline or a fixed anchor.

Inspection of safety belts, etc.

107(1) Where the use of a safety belt, connecting linkage, fall-arresting device, full-body harness or lifeline is required by these regulations, an employer or contractor shall ensure that a competent person:

(a) inspects the safety belt, connecting linkage, fall-arresting device, full-body harness or lifeline:

(i) annually; and

(ii) after the safety belt, connecting linkage, fall-arresting device, full-body harness or lifeline has sustained fall-arresting service; and

(b) determines whether the safety belt, connecting linkage, fall-arresting device, full-body harness or lifeline is safe for continued use.

(2) An employer or contractor shall ensure that a worker inspects the safety belt, connecting linkage, fall-arresting device, full-body harness or lifeline before each use and that where a defect or unsafe condition that may create a hazard to a worker is identified in a safety belt, connecting linkage, fall-arresting device, full-body harness or lifeline:

(a) steps are taken immediately to protect the health and safety of any worker who may be at risk until the defect is repaired or the unsafe condition is corrected; and

(b) as soon as is reasonably practicable, the defect is repaired or the unsafe condition is corrected.

PART XVIII
Confined Space Entry

Interpretation

266 In this Part:

(a) **"confined space"** means an enclosed or partially enclosed space that:

(i) is not primarily designed or intended for human occupancy, except for the purpose of performing work; and

(ii) has restricted means of entrance and exit;

(b) **"hazardous confined space"** means a confined space that is or may become hazardous to a worker entering the confined space due to:

(i) the design, construction or atmosphere of the confined space;

(ii) the materials or substances in the confined space;

(iii) the work activities or processes used in the confined space; or

(iv) any other conditions relating to the confined space;

(c) **"isolate"** means to physically interrupt or disconnect pipes, lines and sources of energy from a confined space.

Identification of confined spaces, hazards, etc.

267 Where a worker may be required or permitted to work in a confined space, an employer, in consultation with the committee, shall identify:

(a) types of confined spaces at the place of employment that a worker may be required or permitted to enter;

(b) types of hazards that are or may be present at each confined space;

(c) alternative means to perform the work to be performed in a confined space that will not require the worker to enter the confined space; and

(d) alterations to the physical characteristics of the confined spaces that may be necessary to ensure safe entrance to and exit from all accessible parts of each confined space.

Avoidance of entry into hazardous confined space

268(1) Where reasonably practicable, an employer shall use an alternative means to perform work that will not require a worker to enter a hazardous confined space.

(2) An employer shall take all reasonably practicable steps to prevent any unauthorized entry into the confined space.

Requirements before confined space is entered

269(1) Where a worker will be required or permitted to work in a confined space, an employer, contractor or owner shall, before requiring or permitting the worker to enter the confined space:

(a) ensure that there is a safe entrance to and exit from all accessible parts of the confined space; and

(b) make all practicable alterations to the physical characteristics of the confined space necessary to ensure a safe entrance to and exit from all accessible parts of the confined space.

(2) In making alterations pursuant to clause (1)(b), an employer shall ensure that the structural integrity of the confined space is maintained.

Requirements before hazardous confined space is entered

270(1) Before a worker is required or permitted to enter a confined space, an employer shall appoint a competent person:

(a) to assess the hazards;

(b) where a hazardous atmosphere has been identified, to test the atmosphere of the confined space for:

(i) oxygen enrichment or deficiency;

(ii) the presence of flammable or explosive substances; and

(iii) the presence and hazardous concentration of airborne chemical substances; and

(c) to determine whether:

(i) work activities or processes will result in the release of toxic, flammable or explosive concentrations of any substances during the worker's occupation of the confined space;

(ii) measures have been taken to ensure that a worker will not drown or become entrapped in any liquid or free-flowing solid present in the confined space;

(iii) the entry of any liquid, free-flowing solid or hazardous substance into the confined space in a quantity that could endanger the health or safety of the worker has been prevented;

(iv) all energy sources that present a hazard to a worker entering into, exiting from or occupying the confined space have been locked out, with the energy sources being put in a zero energy state;

(v) any hazards from biological substances are present in the confined space; and

(vi) the opening for entry into and exit from the confined space is sufficient to allow safe passage of a worker who is using personal protective equipment required by these regulations.

(2) When testing the atmosphere of a confined space pursuant to clause (1)(b), a competent person shall use appropriate and properly calibrated instruments that have been tested to ensure that the instruments are capable of operating safely and effectively.

(3) A competent person who carries out the activities described in clauses (1)(a) to (c) shall prepare a report in writing that sets out:

(a) the results of the assessment, tests and determinations;

(b) recommended special precautions and procedures to reduce the risk to a worker that are to be followed by a worker entering into, exiting from or occupying the confined space; and

(c) recommended personal protective equipment to be used by a worker entering the confined space.

Notice where no hazard found

271 Where a confined space is not identified as a hazardous confined space, an employer shall:

(a) notify a worker who is required to enter the confined space verifying that the confined space is not hazardous;

(b) arrange for a method of communication with a worker on entry to and exit from the confined space and at appropriate intervals while a worker is in the confined space;

(c) prepare a procedure for the removal of a worker who has become injured or incapacitated while in the confined space; and

(d) ensure that the ventilation in the confined space is adequate to maintain safe atmospheric conditions.

Entry plan

272(1) Where a worker will be required or permitted to enter a hazardous confined space, an employer, in consultation with the committee, shall develop a hazardous confined space entry plan to ensure the health and safety of workers who enter or work in the hazardous confined space.

(2) A hazardous confined space entry plan must be in writing and must include:

(a) the tests or measurements necessary to monitor any oxygen deficiency or enrichment or the presence and hazardous concentration of flammable or explosive substances;

(b) the identification of any other hazards that may be present in the hazardous confined space and may put the health or safety of workers at risk;

(c) the means, if any, of isolating the hazardous confined space;

(d) the means, if any, of ventilating the hazardous confined space;

(e) the procedures to enter, work in and exit from the hazardous confined space safely;

(f) the availability, location and proper use of personal protective equipment;

(g) the rescue procedures to be followed, including the number and duties of personnel and the availability, location and proper use of equipment;

(h) the means to maintain effective communication with a worker who has entered the hazardous confined space; and

(i) the availability, location and proper use of any other equipment that a worker may need to work safely in the hazardous confined space.

(3) An employer shall ensure that the following workers are trained in and implement a hazardous confined space entry plan:

(a) a worker who is required or permitted to enter the hazardous confined space;

(b) a worker who attends a worker in the hazardous confined space pursuant to subsection 274(4) or (5);

(c) a worker who may be required or permitted to implement the rescue procedures mentioned in clause (2)(g).

(4) An employer shall make a copy of a hazardous confined space entry plan readily available at the entrance to the hazardous confined space.

Purging and ventilating of unsafe atmosphere

273(1) In addition to the requirements of section 369, where a concentration of a toxic, flammable or explosive substance is present or an oxygen enrichment or deficiency exists in a hazardous confined space, an employer shall ensure that the hazardous confined space is:

(a) purged and ventilated before a worker is allowed to enter the space, so that:

(i) any hazard associated with a toxic, flammable or explosive substance is reduced to the extent that is possible or eliminated; and

(ii) an oxygen content of not less than 19.5% and not more than 23% is ensured; and

(b) continuously ventilated at all times during which the worker occupies the hazardous confined space, to maintain a safe atmosphere.

(2) Where ventilation is used to reduce or eliminate a hazard pursuant to subsection (1), an employer shall ensure that a competent person tests the atmosphere to determine that the confined space is safe for entry by a worker:

(a) before a worker enters the confined space;

(b) where all workers have vacated the confined space, before any worker re-enters the confined space;

(c) on the request of a worker who is required or permitted to enter the confined space; and

(d) continuously where any condition in the confined space may change and put the worker's health or safety at risk.

Precautions where safe atmosphere not possible

274(1) Where a hazardous confined space cannot be purged and ventilated to provide a safe atmosphere or a safe atmosphere cannot be maintained pursuant to section 273, an employer shall ensure that no work is carried on in the confined space except in accordance with the requirements of this section and section 369.

(2) An employer shall ensure that a competent person continuously monitors the atmosphere in a hazardous confined space.

(3) An employer shall ensure that a worker is provided with and required to use a respiratory protective device that meets the requirements of Part VII if:

(a) the airborne concentration for any substance meets or exceeds the permissible contamination limit mentioned in clause 307(1)(a);

(b) oxygen deficiency or enrichment is detected; or

(c) the airborne concentration of any other substance may be harmful to the worker.

(4) An employer shall ensure that a worker in a hazardous confined space is attended by and in communication with another worker who:

(a) has been adequately trained in the rescue procedures mentioned in clause 272(2)(g);

(b) is stationed and remains at the entrance to the confined space unless replaced by another adequately trained worker; and

(c) is equipped with a suitable alarm to summon assistance.

(5) If entrance to a hazardous confined space is from the top:

(a) an employer shall ensure that:

(i) a worker uses a full-body harness and, where appropriate, is attached to a lifeline;

(ii) if a lifeline is used, the lifeline is attended by another worker who is adequately trained in the rescue procedures mentioned in clause 272(2)(g); and

(iii) where reasonably practicable, a mechanical lifting device is available to assist with a rescue and is located at the entry to the confined space while a worker is in the confined space; or

(b) an employer shall ensure that an alternate method of rescue is developed and implemented where the use of a full-body harness or lifeline would create an additional hazard.

(6) If any flammable or explosive dusts, gases, vapours or liquids are or may be present in a hazardous confined space, an employer shall ensure that all sources of ignition are eliminated or controlled.

(7) An employer shall ensure that:

(a) equipment necessary to rescue workers is readily available at the entrance to the hazardous confined space and used in accordance with the rescue procedures developed pursuant to clause 272(2)(g);

(b) the holder of a class A qualification in first aid is available to provide immediate first aid; and

(c) personnel who are trained in the rescue procedures developed pursuant to clause 272(2)(g) and who are fully informed of the hazards in the confined space are readily available to assist in a rescue procedure.

Piping discharging hazardous substances

275(1) Where a worker may be required or permitted to work in a confined space into which piping may discharge a hazardous substance, an employer shall ensure that the piping:

(a) has a blank installed that is sized for the proper pressure in the piping before the piping enters the confined space;

(b) is equipped with two blocking valves and a bleed-off valve installed between the blocking valves located so that any bleed off does not contaminate the confined space; or

(c) is equipped with an approved safety device.

(2) Where piping is equipped with two blocking valves and a bleed-off valve pursuant to clause (1)(b) or an approved safety device pursuant to clause (1)(c), an employer shall ensure that:

(a) the valves in the flow lines are locked out in the "closed" position and the bleed-off valve is locked out in the "open" position;

(b) the valves are tagged to indicate that the valves must not be activated until the tags have been removed by a worker designated by the employer for that purpose; and

(c) the worker designated pursuant to clause (b):

(i) monitors the valves to ensure that they are not activated while a worker is in the confined space; and

(ii) records on the tag mentioned in clause (b) the date and time of each monitoring and signs the tag each time the worker monitors the valves.

Substances listed in Table 21

307(1) Where a chemical substance or biological substance listed in Table 21 of the Appendix is present at a place of employment, an employer shall:

(a) to the extent that is reasonably practicable, ensure that the contamination limit set out in Table 21 is not exceeded in any area where a worker is usually present; and

(b) take all practicable steps to ensure that no worker's personal exposure exceeds the contamination limit set out in Table 21.

(2) An employer, in consultation with the committee, shall develop a written procedure that meets the requirements of subsection (3) where a chemical substance or biological substance listed in Table 21 of the Appendix is present at a place of employment in an airborne concentration that may be hazardous to a worker, and a worker:

(a) is regularly required or permitted to work more than eight hours in a day or 40 hours in a week; or

(b) may be exposed to a combination or association of substances listed in Table 21 of the Appendix that have similar toxicological effects when acting on the same organ or body system.

(3) A written procedure required by subsection (2) must identify:

(a) the substances to which a worker may be exposed;

(b) the conditions under which a worker will be required or permitted to work, including the frequency, quantity and duration of exposure to the substances; and

(c) the steps that the employer will take to ensure, to the extent that is practicable, that no worker's personal exposure exceeds the equivalent of the contamination limit set out in Table 21 of the Appendix.

(4) An employer shall implement a procedure developed pursuant to subsection (2).

TABLE 9

[Clause 54(1)(a) and subsection 54(5)]

Summary of First Aid Requirements[1]

Minimum: Every place of employment requires a first aid box containing standard supplies (see Table 10), a manual, a register and emergency information. Additional requirements are listed below:

Workers	Close (1/2 hour or less to medical facility)	Distant (1/2 - 2 hours to medical facility)	Isolated (More than 2 hours' surface transport to medical facility, or normal mode of transport is aircraft)
1	minimum	minimum	minimum
2 - 4	minimum	minimum plus • blankets, stretcher and splints • Class A attendant and supplies for high hazard work[2]	minimum plus • blankets, stretcher and splints • Class A attendant and supplies for high hazard work[2]
5 - 9	minimum plus • Class A attendant and supplies for high hazard work[2]	minimum plus • Class A attendant and supplies • blankets, stretcher and splints	minimum plus • Class A attendant and supplies • blankets, stretcher and splints
10 - 20	minimum plus • Class A attendant and supplies	minimum plus • Class A attendant and supplies • blankets, stretcher and splints	minimum plus • Class A attendant and supplies • blankets, stretcher and splints
21 - 40	minimum plus • Class A attendant and supplies	minimum plus • Class A attendant and supplies • blankets, stretcher and splints	minimum plus • Class B attendant and supplies for high hazard work[2] • Class A attendant and supplies for other work • blankets, stretcher and splints

41 - 99	minimum plus • Class A attendant and supplies	minimum plus • Class B attendant and supplies for high hazard work[2] • Class A attendant and supplies for other work • blankets, stretcher and splints	minimum plus • Class A attendant for low hazard work[3] • EMT for high hazard work[2] • Class B attendant and supplies for other work • blankets, stretcher and splints
100 +	minimum plus • 2 Class A attendants and supplies	minimum plus • First aid room • 1 EMT and 1 Class B attendant and supplies for high hazard work[2] • 2 Class A attendants and supplies for other work • blankets, stretcher and splints	minimum plus • first aid room • 1 EMT, 1 Class B attendant and supplies for high hazard work[2] • 2 Class A attendants and supplies for low hazard work • 2 Class B attendants and supplies for other work. • blankets, stretcher and splints

[1]Hospitals, medical facilities and other health care facilities where a physician or registered nurse is always readily available and close places of employment where the work is entirely low-hazard work are exempt.

[2]Activities that constitute high hazard work are listed in Table 8 of the regulations.

[3]Low hazard work is work of an administrative, professional or clerical nature that does not require substantial physical exertion or exposure to work processes, substances or other conditions that are potentially hazardous.

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TABLE 10

[Subsection 54(5), clause 56(1)(a), section 59]

Required Contents of First Aid Box

Amounts or quantities of the following supplies and equipment adequate for the expected emergencies, contained in a well-marked container:

Antiseptic, wound solution or antiseptic swabs
Bandage – adhesive strips and hypoallergenic adhesive tape
Bandage – triangular, 100-centimetre folded, and safety pins
Bandage – gauze roller, various sizes
Dressing – sterile and wrapped gauze pads and compresses, various sizes including abdominal pad size
Dressing – self-adherent roller, various sizes
Pad with shield or tape for eye
Soap
Disposable latex or vinyl gloves
Pocket mask with disposable one-way rebreathe valves
Forceps – splinter
Scissors – bandage.

4 Oct 96 cO-1.1 Reg 1.

TABLE 11

[Subsection 54(5) and clause 60(2)(a)]

Additional Supplies and Equipment - Class A Qualification

Bag – hot water or hot pack
Bag – ice or cold water
Bandage – elastic, 5-centimetre and 10-centimetre widths
Sterile burn sheet
Any other first aid supplies and equipment that are appropriate to the dangers and other circumstances of the place of employment and commensurate with the training of the first aid attendant.

4 Oct 96 cO-1.1 Reg 1.

TABLE 12

[Subsection 54(5) and clause 60(2)(b)]

Additional Supplies and Equipment - Class B Qualification

Bag – hot water or hot pack
Bag – ice or cold water
Bandage – elastic, 5-centimetre and 10-centimetre widths
Sterile burn sheet
Stethoscope with a bell
Sphygmomanometer
Thermometer
Where there are potential causes of spinal injury, short and long spine boards with adequate restraining straps and medium and large cervical collars
Emergency oxygen system
Bag valve and mask resuscitator
Any other first aid supplies and equipment that are appropriate to the dangers and other circumstances of the place of employment and commensurate with the training of the first aid attendant.

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TABLE 21

[Sections 307 and 309, clause 346(f)]

Contamination Limits

CAS Number	Substance	8-hour average Contamination Limit mg/m³*	15-minute average Contamination Limit mg/m³*
7647-01-0	Hydrogen chloride	**C7.5	—
74-90-8	Hydrogen cyanide, and cyanide salts, (as CN)	**C5	—
7664-39-3	Hydrogen fluoride, (as F)	**C2.6	—
7722-84-1	Hydrogen peroxide	1.4	2.8
7783-07-5	Hydrogen selenide, (as Se)	0.16	0.48
7783-06-4	Hydrogen sulfide	14	21

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* Milligrams of substance per cubic metre of air

** C denotes ceiling limit

Resources

Saskatchewan occupational health and safety publications

- *The Occupational Health and Safety Act, 1993*
- *The Occupational Health and Safety Regulations, 1996*
- Elements of an Occupational Health and Safety Program
- Occupational Health Committee Manual
- Setting Up an Occupational Health and Safety Program: A Guide
- Video Catalogue
- WHMIS Worker Training Requirements

Internet sites

Use these sites to find more information about health and safety!

- Canadian Centre for Occupational Health and Safety (CCOHS): http://www.ccohs.ca/oshanswers/hsprograms/hsprograms.htm
- Grain Services Union: http://www.gsu.ca/
- Manitoba Workplace Safety and Health Division. *Workplace Safety and Health Self-Audit* publication: http://www.gov.mb.ca/labour/safety/publicat/other/selfaudit.html
- National Safety Council (US): http://www.nsc.org/
- Office of the Queen's Printer (Saskatchewan Justice): http://www.qp.gov.sk.ca/ (the legislation is available in electronic form)
- Saskatchewan Labour homepage: http://www.labour.gov.sk.ca/
- Saskatchewan Workers' Compensation Board homepage: http://www.wcbsask.com/
- Workers' Compensation Board of British Columbia: http://www.worksafebc.com/